

Some Thoughts on Breeding for Hardiness in Section Tsutsusi Azaleas

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I grow azaleas as a hobby in Omaha, Nebraska. Omaha is in hardiness zone 5. The temperature falls below minus 15 degrees Fahrenheit at least once every winter. The climate is continental, that is, erratic. The temperature can change by 50 degrees Fahrenheit in the course of an afternoon. High winds are frequent. Snow amounts are not large. Total snowfall might be 30 inches in the course of a winter. The snow gets blown around, so many areas are free of snow, while others are buried in drifts.

In this climate, azaleas have a hard time. Few commercial varieties will succeed. I have been trying to breed a broader spectrum of azaleas for the region.

Azalea breeding is a subject with great uncertainty. The theory of heredity is reasonably well known, but specific application for its application to azaleas is lacking. There is almost no information on the genes responsible for any azalea characteristics. The best one can do is attempt to apply the theory while guessing at the actual facts.

The basic strategy for breeding hardy azaleas is to cross a hardy parent with a beauty parent. When hardiness has been achieved, strategy may be changed to crossing plants, both containing hardiness parentage and beauty parentage. The species available as hardy parents are: *Rhododendron yedoense* v. *R. poukhanense* (known as *R. poukhanense*), *R. tschonoskii*, *R. kaempferi*, and *R. kiusianum*.

Poukhanense is the most commonly used hardy parent. There is no doubt about its hardiness. It has large lavender flowers and the plant habit is a little loose. It is a reasonably uniform plant, that is, one *poukhanense* plant is very much like any other. There is a narrow range of flower colors; mostly lavender with some tendency toward pink. One judgment about the plant is that, for most genes, it is homozygous. In other words, the plant will have two identical examples of any given gene.

R. tschonoskii is also very hardy. Indeed, it has the reputation of being the hardiest azalea. It is also quite uniform. However, it is of little ornamental value. The flowers are white and very small. There is only one named *R. tschonoskii* hybrid, Gable's 'Forest Fire'. It, too, has tiny flowers. Like *R. poukhanense*, *R. tschonoskii* appears to be largely homozygous.

R. Kaempferi has also been widely used as a hardy parent.

It is less uniform than the two preceding plants. There is considerable variation in color.

R. kiusianum has less frequently been used as a hardy parent, possibly because it is generally considered less hardy than the preceding plants. It is a less uniform plant, with many flower color variations. I also find variations in hardiness. One lavender *R. kiusianum* seems to be just about as hardy as *R. poukhanense*. Pink and red forms do poorly in my climate.

When plants are crossed, each plant in the seed batch receives one copy of any given gene from one parent. If a plant is truly homozygous, each child plant will have one copy of each of its genes. Thus, all the products of a *R. poukhanense* or *R. tschonoskii* cross will have one copy of whatever gene or genes that produce hardiness. The tendency toward hardiness seems to be borne out in practice. Hardy *poukhanense* crosses include 'Cascade' (Shamarello, *R. poukhanense* x *mucronatum*), 'Mildred Mae' ('Gable', *R. poukhanense* x *mucronatum*), 'Zulu' ('Glenn Dale', *R. poukhanense* x 'Modele') and my variety 93 (*R. poukhanense* x unknown southern indicum). Unfortunately, the tendency is also to inherit the *R. poukhanense* lavender flower color, at least as an undertone. Only 'Cascade' escapes this curse. Further action is usually necessary to produce hardy ornamental plants.

The above discussion is a little simplistic. Just because a given version of a gene is present doesn't mean that it is expressed. The partner gene inherited from the other member of the cross may be dominant. An example of this tendency seems to be my variety 41 (*R. poukhanense* x salmon supermarket azalea). It is scarcely a hardy plant in Nebraska and rarely blooms.

A possible approach to further improvement in hardy azaleas is to cross more self *R. poukhanense* hybrids. With regard to hardiness, this approach seems to be somewhat disappointing. If both parents contain one copy of a gene that promotes hardiness, the probability that a given child plant will contain that gene is 0.75. If two genes are required to produce hardiness, the probability that a given child will contain both genes is 0.56. As the number of genes required for hardiness increases, the probability that a given child will contain all of them decreases further. This tendency is not a complete disaster. It just means more plants need to be grown to achieve a given result.

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Magnolia Plantation (Continued from page 14)

lias. J. Drayton Hastie Jr., a namesake of John G. Drayton, always believed the garden had rare plant material within its borders. The task was to find it.



Photo Miles Beach

▲ 'Prince of Orange'

In 2010, Bart Brechter, curator of gardens at Bayou Bend in Houston, came to Magnolia to study the azaleas and locate, if possible, any rare varieties. Mr. Brechter covered only a small part of the garden, but found more than 10 rare, endangered varieties.

Tom Johnson, Magnolia's Executive Director, believes that once the survey expands many more rare, possibly extinct, varieties will be rediscovered. Over its 300 year history Magnolia has stood sentinel on the Ashley River, silently witnessing the events of our shared past, all the while guarding her own. A history now being revealed which will place Magnolia once again in the national consciousness.

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Another approach is to use a variable parent, such as *kiusianum*. Here the tendency toward hardiness is less favorable in the first generation, since the hardiness parent may only have one copy of any gene that promotes hardiness. In that case, the probability that the gene is passed on to any given child plant is only 0.5. On the other hand, there is a chance

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Our featured speaker was Steve Brainerd, Park Development Superintendent, City of McKinney. Steve designed the Ina Brundrett Azalea Garden and the Jonsson Color Garden, the original azalea garden at the Dallas Arboretum. Steve is a former National President of Azalea Society of America as well as a past President of the Dallas chapter of ASA. He has authored extensive articles for 'The Azalean.' His presentation focused on the planting of azaleas for four-season color.

Following a brief business meeting, we were given a tour of the facility and garden by Mitch Andrews, director of the TJC advisory committee. His surprise to us was a private screening of one of the current shows, *Cosmic Collision*.

Vaseyi

Suzanne W. Medd, Secretary

On February 26, members met and discussed the programs for the year. Richard and Betty Becker graciously invited Vaseyi members to visit their garden in April. It was suggested that we also visit the garden of Marilyn Grist. This would allow a sneak preview of two of the premiere gardens of the convention.

On March 25, the convention planning committee met and worked out many of the final details. Bob Stelloh shared the beautiful "Appalachian Spring" T-shirt design.

A visit to Vivian Abney's East Fork Nursery was April's meeting with a picnic lunch. As usual Vivian had gift plants for all members!

On May 3rd, Vaseyi members set up their various convention areas, and prepared their gorgeous gardens; Marilyn Grist, the Collins, the Stellohs and the Bells were excited to share their work with visitors from around the country and the world. Mother Nature did not disappoint either because our chapter namesake, the native rare *R. vaseyi* was in beautiful early bloom on the Blue Ridge Parkway!

Our joint convention with ARS was a huge success. A hearty "Thank You" to so many hard working Vaseyi Chapter members!

that a favorable characteristic, such as color, will be passed on. Experience with my variety 96 (*R. kiusianum* x ('Ivan Anderson' x *R. oldhamii*)) illustrates this possibility. Some of these plants are hardy, with white, red, and lavender flowers.

Breeding efforts continue. Time will tell whether any of these ideas work out.